What is claimed is:

1. A process for the production of an amide comprising:

(a) reacting R_1-CX and oxygen to form R_1-COOH, wherein the reacting occurs in the liquid or vapor phase and in the presence of a first catalyst, wherein X is a group that leaves upon oxidation, and wherein R_1 is phenyl, which is unsubstituted or substituted by one or more identical or different radicals selected from (C_1-C_{12})-alkyl, (C_1-C_{12})-alkoxy, (C_1-C_{12})-alkanoyloxy, (C_1-C_{12})-alkanoyl, amino, hydroxyl, -CH_2-O-(C_1-C_{12})-alkyl, -NH-(C_1-C_{12})-alkyl, -NH-CO-(C_1-C_{12})-alkyl, or -S-(C_1-C_{12})-alkyl,

(b) separating the R_1-COOH from the mixture formed in step (a), wherein the R_1-COOH is maintained in a liquid or vapor phase, and

(c) reacting the R_1-COOH maintained in the liquid or vapor phase from step (b) with an amine to form an amide, wherein the reacting occurs in the vapor phase and in the presence of a second catalyst.

2. The method of claim 1, wherein X is -H_3.

3. The method of claim 1, wherein R_1 is meta-methylphenyl.

4. The method of claim 1, wherein the amine is a secondary amine.

5. The method of claim 1, wherein the amine is diethylamine.

6. The method of claim 1, wherein the amine is ethylhexylamine.

7. The method of claim 1, wherein at least one of the first and second catalysts is a liquid catalyst.

8. The method of claim 1, wherein at least one of the first and second catalysts is a solid catalyst.

9. The method of claim 1, wherein at least one of the first and second catalysts is selected from one or more of MgO, TiO_2, ZrO_2, ZnO, CeO_2, Ce_2O_3, tungsten heteropolyacid, hydroxyapatite, cobalt octoate, and copper octoate.

10. The method of claim 1, wherein at least one of the first and second catalysts is TiO_2.

11. The method of claim 1, wherein at least one of the first and second catalysts is cobalt octoate.

12. The method of claim 1, wherein at least one of the first and second catalysts is tungsten heteropolyacid.

13. The method of claim 1, wherein at least one of the first and second catalysts is hydroxyapatite.

14. The method of claim 1, wherein in step (c) the reaction of the R_1-COOH and the amine occurs in the presence of an added amount of the amide.

15. The method of claim 1, wherein the R_1-COOH in step (b) is maintained in a liquid phase and an amount of the amide is added to solubilize the R_1-COOH prior to the reacting in step (c).

16. The method of claim 1, wherein the weight ratio of the R_1-COOH and the amine is from about 1:1 to 4:1.

17. The method of claim 1, wherein the weight ratio of the R_1-COOH and the amine is about 2:1.

18. The method of claim 15, wherein the weight ratio of the R_1-COOH, the amine, and the added amount of amide is about 2:1:2.

19. The method of claim 1, wherein at least one of the reacting in steps (a) and (c) takes place in a tube reactor.

20. The method of claim 1, wherein the reacting in steps (a) and (c) takes place in tube reactors.

21. The method of claim 1, wherein at least one of the reacting in steps (a) and (c) takes place in two or more tube reactors connected in parallel.

22. The method of claim 1, wherein the process is a continuous process.

23. A process for the production of N,N-di(ethyl)-meta-toluamide comprising:

(a) reacting meta-xylene and oxygen to form meta-toluic acid, wherein the reacting occurs in the liquid or vapor phase and in the presence of a first catalyst,

(b) separating the meta-toluic acid from the mixture formed in step (a), wherein the meta-toluic acid is maintained in a liquid or vapor phase, and

(c) reacting the meta-toluic acid maintained in the liquid or vapor phase from step (b) with diethylamine to form N,N-di(ethyl)-meta-toluamide, wherein the reacting occurs in the vapor phase and in the presence of a second catalyst.

24. The method of claim 23, wherein at least one of the first and second catalysts is a liquid catalyst.

25. The method of claim 23, wherein at least one of the first and second catalysts is a solid catalyst.

26. The method of claim 23, wherein at least one of the first and second catalysts is selected from one or more of MgO, TiO_2, ZrO_2, ZnO, CeO_2, Ce_2O_3, tungsten heteropolyacid, hydroxyapatite, cobalt octoate, and copper octoate.

27. The method of claim 23, wherein at least one of the first and second catalysts is TiO_2.

28. The method of claim 23, wherein at least one of the first and second catalysts is cobalt octoate.

29. The method of claim 23, wherein at least one of the first and second catalysts is tungsten heteropolyacid.

30. The method of claim 23, wherein at least one of the first and second catalysts is hydroxyapatite.

31. The method of claim 23, wherein in step (c) the reacting of the meta-toluic acid and the diethylamine occurs in the presence of an added amount of N,N-di(ethyl)-meta-toluamide.

32. The method of claim 23, wherein the meta-toluic acid in step (b) is maintained in a liquid phase and an amount of the N,N-di(ethyl)-meta-

toluamide is added to solubilize the meta-toluic acid prior to the reacting in step (c).

33. The method of claim 23, wherein the weight ratio of the meta-toluic acid and the diethylamine is from about 1:1 to 4:1.

34. The method of claim 23, wherein the weight ratio of the meta-toluic acid and the diethylamine is about 2:1.

35. The method of claim 32, wherein the weight ratio of the meta-toluic acid, the diethylamine, and the added amount of N,N-di(ethyl)-meta-toluamide is about 2:1:2.

36. The method of claim 23, wherein at least one of the reacting in steps (a) and (c) takes place in a tube reactor.

37. The method of claim 23, wherein the reacting in steps (a) and (c) takes place in tube reactors.

38. The method of claim 23, wherein at least one of the reacting in steps (a) and (c) takes place in two or more tube reactors connected in parallel.

39. The method of claim 23, wherein the process is a continuous process.